

CARS on the move

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From the Director

This first issue of CARS On The Move marks the beginning of a new phase in the progress of our organization. It is different in spirit and focus than our original CARS newsletter, InfoCARS, published in the early days when construction and funding were key issues. All three X-CARS are now on-line as National Synchrotron User Facilities serving a broad spectrum of scientific communities. The focus of CARS is science and how to best enable it for the community. This is the spirit we hope to capture in the current newsletter.

The newsletter will report on the CARS staff, the facility, our users, and at times, highlights of the exciting science being done every beam-day at CARS. In User Watch, we count on the input from our users on just about any aspect of their experience at the facility.

Our current plan is to publish a newsletter regularly. We hope that we can capture in these few pages glimpses of those things that make this facility a place where users want to do excellent science.

Stuart Rice
CARS Executive Director

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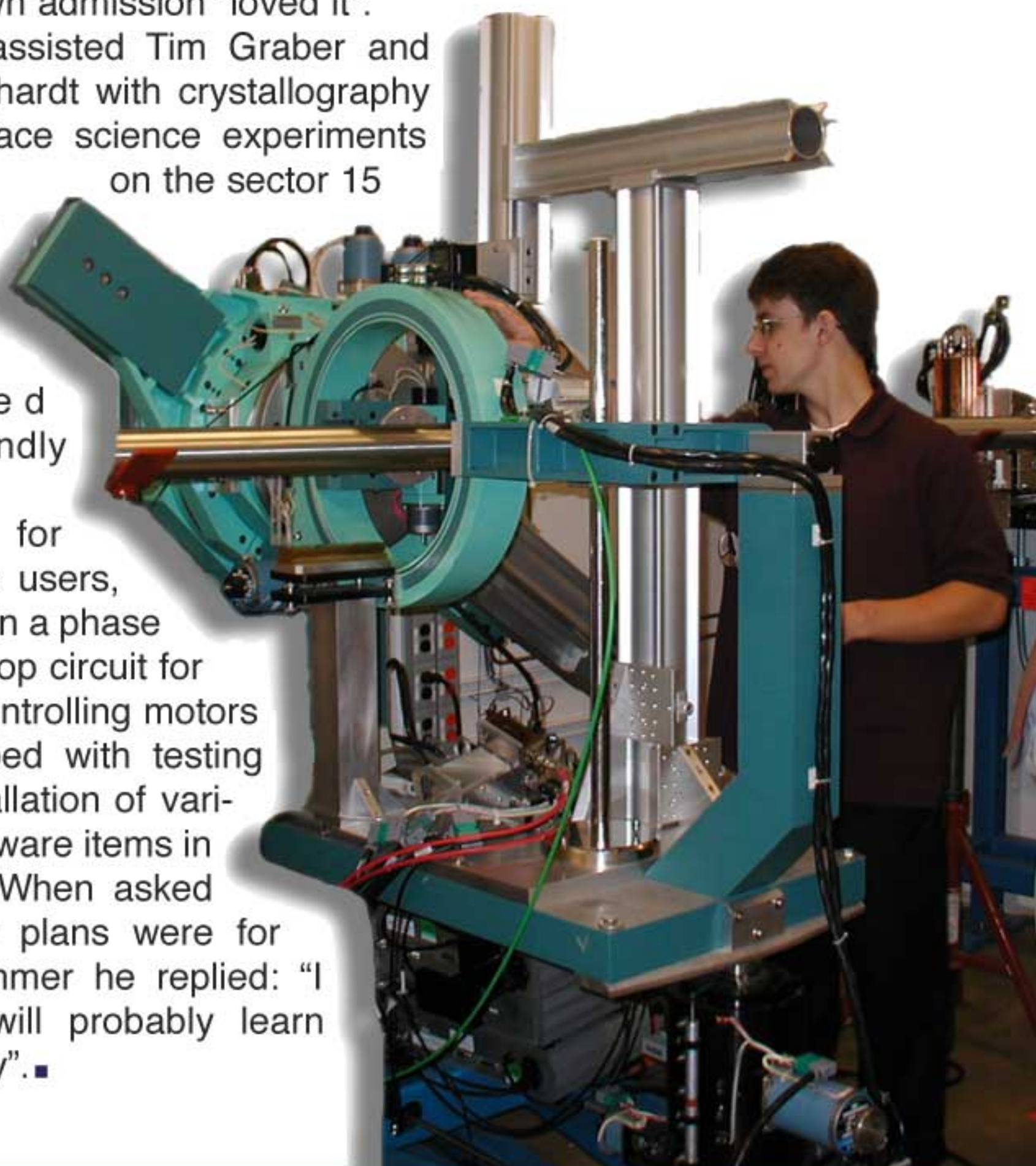
Summer Internship

Charlie Richter works at ChemMatCARS.

Working may not qualify as the preferred summer activity for the average teenager unless your name is Charlie and you get to spend your days surrounded by blinking lights, powerful computers and lots of other "cool" toys. An accomplished Oak Park and River Forest High School senior student -he just received the prestigious Caltech Signature Award for his outstanding ability in science- Charlie did an internship for ChemMatCARS and

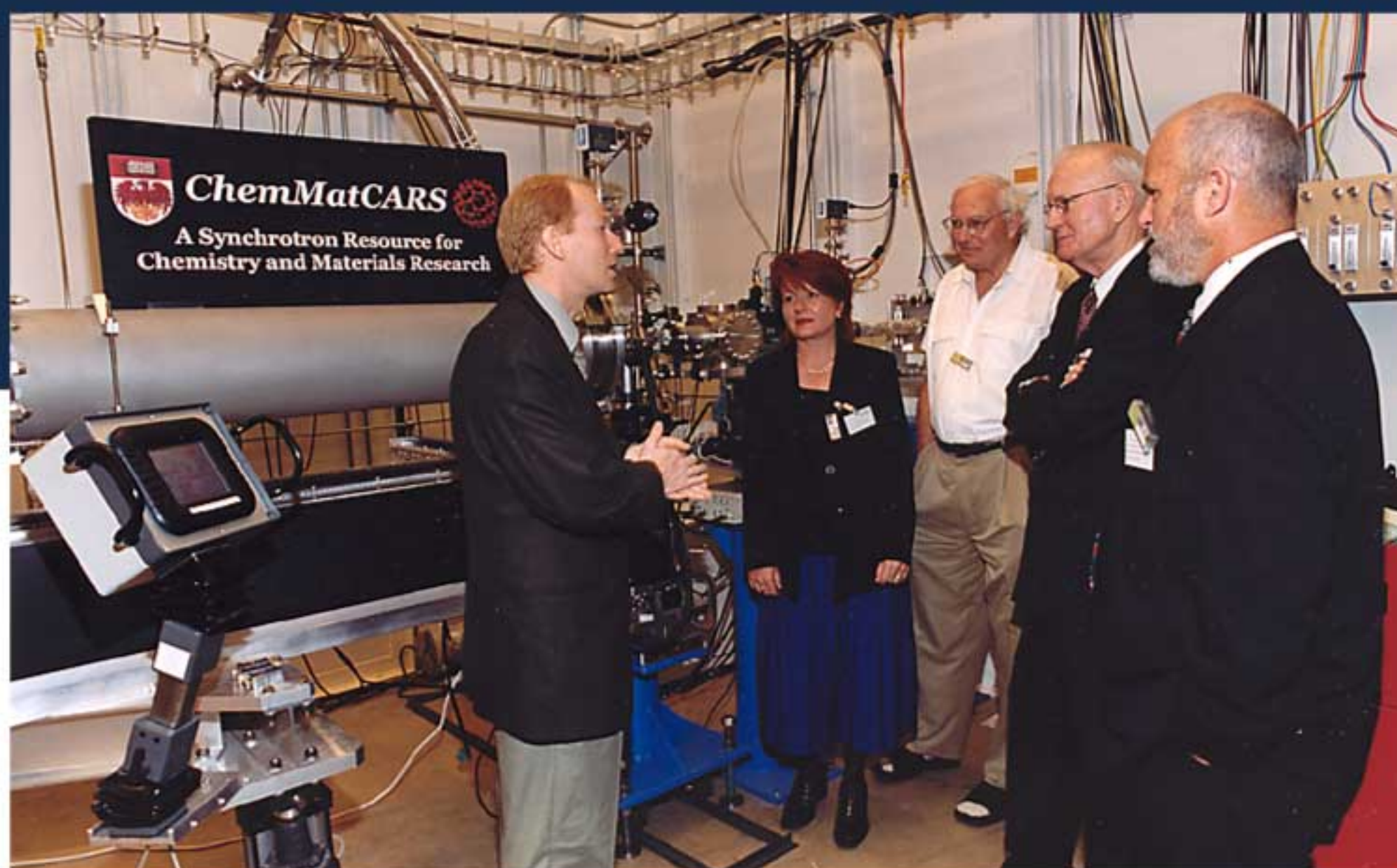
by his own admission "loved it". Charlie assisted Tim Graber and Jeff Gebhardt with crystallography and surface science experiments on the sector 15

undulator beam-line. He also created user-friendly epics screens for beamline users, worked on a phase locked loop circuit for use in controlling motors and helped with testing and installation of various hardware items in the lab. When asked what his plans were for next summer he replied: "I think I will probably learn how to fly". ■



Consortium for Advanced

C A



Australian Consul visits CARS

On the last Wednesday of August 2002, three senior staffers from the Australian Consulate in Chicago paid a visit to CARS. They included Mr. Jim Enright (Trade Commissioner), Ms. Melissa Stenfors (Consul), and the Consul General Mr. Ronald Harvey. They wanted to see for themselves the facility that has seen a large investment from Australia - both scientific and financial over the last five years.

Clockwise, Dr. David Cookson, Ms. Melissa Stenfors, Prof. John White, Mr. Ronald Harvey and Mr. Jim Enright.

As Australia gears up to build its own synchrotron, the CARS facility is expected to play an ever-increasing role in the growing Australian user community. Drs. David Cookson and Harry Tong are the Australian-funded scientists permanently stationed at CARS, representing part of an ongoing commitment to the facility. The Australian Synchrotron Research Program is currently an institutional member of CARS. ■

X-CARS Nuggets

BioCARS

Funding for "BioCARS: A Synchrotron Structural Biology Resource" has been received from the NIH National Council for Research Resources (NCRR) Biomedical Technology Resource Center Program as the result of a competitive renewal proposal submitted last October. The grant for \$9.8M is for a five-year period beginning August 2002 which marks the beginning of the eleventh year of NIH support for BioCARS under the leadership of Principal Investigator, Keith Moffat. This award supports the operations of the BioCARS national resource on Sector 14 at the Advanced Photon Source. BioCARS is among the most active sectors at the APS. During this past year, close to 200 users have con-

ducted research on the BioCARS facilities and published over 50 scientific papers.

Note: The NIH has granted BioCARS an additional \$1.25M for a large area, fast readout CCD detector system.

GSECARS

Funding for "GeoSoilEnviroCARS: A National Resource for Earth, Planetary and Environmental Science Research at the Advanced Photon Source" has been received from the Earth Sciences Instrumentation and Facilities Program at the National Science Foundation, as the result of a competitive proposal submitted in January 2002. The grant for \$6.6M is for a four-year period beginning October 2002, which marks the beginning of the ninth year of NSF support for

School at CARS

Last August, two groups of students enrolled in the Annual National School for X-ray and Neutron Scattering held at Argonne spent a couple of days doing experiments in CARS beamlines 13 and 15 as part of the course.

At GSECARS, the students used the x-ray microprobe on the undulator beamline to study elemental composition and oxidation states in a basaltic glass grown in an electric field to simulate the variability of oxygen abundance found in meteors and terrestrial basalts. After learning about quantitative x-ray fluorescence (XRF) and x-ray absorption near-edge spectroscopy (XANES), the students collected x-ray fluorescence and XANES data to determine relative elemental concentrations and valences.

At ChemMatCARS, students

GSECARS. GSECARS is also among the most active sectors at the APS, with over 420 beamtime proposals and over 320 users since we began operations in 1997.

ChemMatCARS

ChemMatCARS has been busy commissioning several capabilities as user facilities. After a series of mechanical verifications and internal commissioning, the surface science spectrometer had a very successful user run this summer. Regular scheduling of users will begin this next run. The SAXS instrument is also under final commission tests. A SAXS user run is also planned for November of this year. SAXS and surface will complement the micro crystallography facility which has been on-line since early 2002. ■

Radiation Sources

RS



"Greeting the user groups and helping them get started is probably my favorite part of the whole process."

received a brief theory behind SAXS (small-angle x-ray scattering) experiments and then looked at x-ray scattering from aqueous solutions of commercially produced silicon spheres which were on the order of hundreds of Angstroms in diameter. The group was able to estimate this size from analysis of their data. Both experiments were chosen for oral presentations by the group at the end of the course. ■

ANSTO/ASRP Renews Agreement

The Australian Nuclear Science and Technology Organization (ANSTO) on behalf of the Australian Synchrotron Research Program (ASRP) renewed its agreement to provide support to ChemMatCARS and BioCARS through seconded scientists and a financial contribution to support facility operations. CARS and ANSTO/ASRP look forward to the continued productive interaction both organizations have enjoyed since ANSTO/ASRP joined CARS as an Institutional Member in 1996. ■

UIC Joins CARS

CARS is pleased to announce that the University of Illinois-Chicago was ratified as a CARS Institutional Member in mid 2001. This brings the total number of Institutional Members to five. The UIC representatives to the CARS Board of Governors are Prof. M. Schlossman and Prof. N. Sturchio. Dr. David Schultz has been seconded to CARS on behalf of UIC. ■

Meet the Staff Dixie Franklin User/Proposal Coordinator

Organizing comes naturally to Dixie, who has been coordinating user visits to CARS beamlines for the last four years. Ironically, for somebody who actively avoided physics and chemistry throughout school, Dixie now spends her days surrounded by scientists -she even married one!- and thinks nothing of such fancy terms as "microprobe" or "high-flux". She jokes that "I probably have an answer for anything around here, unless it has to do with science".

After taking care of hundreds of user groups, Dixie has become an expert in the logistics of a visit. Quiz her on topics such as ANL security clearance, safety training, sample shipping procedures, accommodation or directions to Argonne and she will tell you all you need to know. She will even book a taxi to the airport or recommend a nice restaurant if asked nicely!

Upon arrival, Dixie greets CARS users and helps them get started with preliminary requirements and orientation before introducing them to the scientific staff member who will assist them with their experiments. ■

User Watch

This column is devoted to user issues including science nuggets, personalities and comments about CARS. For this first issue, we wish to highlight special user groups who have made a unique contribution to the facilities at CARS.

BioCARS

Data from BioCARS was instrumental in the structure determination of the 22nd amino acid, pyrrolysine, by Ohio State research groups of Chan and Krzycki (Science 296 1462-1466 (2002)).

The 1.55 Angstrom structure of Methanosarcina barkeri monomethylamine methyltransferase (MtmB) revealed a homohexamer comprised of individual subunits with a TIM barrel fold. The UAG-encoded residue shows an electron density distinct from any of the other 21 natural amino acids.

ChemMatCARS

We are indebted to Prof. John White from the Australian National University for his helpful input during the refinement of the SAXS station and to Dr. Vic Young from the University of Minnesota for his excellent guidance in bringing the Micro-crystallography capability on-line.

GSECARS

The multi-anvil press operation at GSECARS collaborates closely with several groups across the country. For instance our new capability for ultrasonic studies in the 1000-ton press depends heavily on a collaboration with Baosheng Li from the Mineral Physics Institute at SUNY Stony Brook. Our recent work in making deformation measurements at high-pressure with the D-DIA apparatus is the result of a collaboration with Bill Durham at Lawrence Livermore National Laboratory, who built the apparatus that GSECARS designed, and brought it to 13-BM-D twice during the last run. ■



Calendar

Nov. 14.....	NIH BioCARS Advisory Committee Meeting
Nov. 28.....	Thanksgiving - No User Beam
Dec. 19.....	End of 2002-3 User Run
Dec. 22 - Jan.2	ANL Holiday Shutdown
Jan. 29 - Apr.20	2003-1 User Run
March 1	Deadline for 2003-2 APS General User Proposals
April 29 - May 1	12th APS User Meeting
May 28 - Aug. 31	2003-2 User Run

Proposal Submission Information

User Administration

UofC Office

APS Office

www: cars.uchicago.edu



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